sociation, and his memoir on the vapour density of chloral hydrate gave rise to a memorable controversy on the value of volumetric considerations in the determination of equivalents. In conjunction with Hautefeuille he followed Debray in elucidating the laws governing dissociation, the recognition of the fundamental phenomena of which we owe to Deville. In this connection we may cite the memoirs on the conditions determining the absorption of hydrogen by palladium, potassium, and sodium, the dissociation of the sesquichloride of silicon, and the transformations of cyanogen into paracyanogen, and of cyanic acid into cyanuric acid. With Deville he studied the porosity of metals at high temperatures, and with Hautefeuille the solubility of gases in metals.

Troost was a frequent contributor to metallurgical chemistry, and made important contributions to our knowledge of the parts played by silicon and manganese in determining the physical properties of the various forms of commercial iron. His treatise of chemistry, which originated out of his connection with the Sorbonne, has gone through innumerable editions, and for many years past has been a standard text-book to successive generations of pupils.

Troost, in spite of his advanced years, enjoyed excellent health up to a short time before his death. He preserved his faculties practically unimpaired, and was active and industrious to the last on the numerous commissions in which he took part, and more particularly on the Commission des Inventions at the Ministry of War, of which he had been president for some years past.

NOTES.

We notice with regret the announcement of the death, on October 7, of Dr. J. Hughlings Jackson, F.R.S., consulting physician to the London Hospital, at seventy-six years of age.

The Decimal Association announces that a weights and measures law, rendering the use of the metric system compulsory in Bosnia-Herzegovina, will come into force on September 1, 1912.

The Harveian oration will be delivered by Dr. C. Theodore Williams at the Royal College of Physicians of London on Wednesday next, October 18.

Recent progress in model or small-power engineering, both as a hobby and as a useful factor in technical education, will be demonstrated at the Model Engineer Exhibition—the third of its kind—to be held at the Royal Horticultural Hall, Westminster, on October 13–21.

We notice with regret that the death is announced, on September 25, in his sixty-eighth year, of Prof. Auguste Michel-Lévy, the distinguished geologist and member of the Paris Academy of Sciences.

The *Terra Nova* of Captain Scott's British Antarctic Expedition returned safely to Lyttelton, N.Z., on October 7. Lieut. Filchner, the leader of the German South Polar Expedition, left Buenos Aires a few days ago for the Antarctic in the *Deutschland*. It is announced from Sydney that the fund for Dr. Mawson's Antarctic Expedition now amounts to 43,000*l*.

Dr. J. H. H. Teall, F.R.S., director of H.M. Geological Survey, will take the chair at the first of the Selborne lectures of the season, to be held on Monday, October 16. The subject will be "The Evolution of Scenery," and the lecturer Mr. F. W. Rudler.

Dr. W. E. Adeney, of Dublin, who has devoted particular attention to questions of sewage pollution, has been invited by the Metropolitan Sewage Commission of New York to advise it in reference to the over-pollution of the waters of the harbour of that city. Dr. Adeney served as a member of the recent "Whisky Commission."

Dr. Wilhelm Dilthey, whose death is announced at the advanced age of seventy-seven, was professor of philosophy at the University of Berlin until 1905, when he resigned owing to ill-health. He held his chair as successor to Lotze, and had previously been professor of philosophy in Basel, Kiel, and Breslau. Although, perhaps, best known for his "Leben Schleiermachers," which brought him into notice in 1870, he published a number of other essays and books, some of which are of considerable philosophical importance.

In connection with the Exhibition of British Fisheries, &c., at Manchester, which was opened on Saturday, October 7, by his Excellency the Greek Minister, the Hull Museums Committee has an extensive exhibit of old whaling appliances, paintings, models, &c., of the old whaling ships. Mr. T. Sheppard, the curator, has issued an illustrated guide to the collection (32 pages, one penny) which is a useful account of the various weapons and tools used by the old Hull whalers. It is interesting to learn that both the present enormous fishing and oil industries at Hull have developed from the whaling trade.

The fifty-seventh report of the Postmaster-General on the Post Office, which has just been issued as a Blue-book (Cd. 5868), records that the number of radio-telegrams dealt with showed a satisfactory increase, the outward messages to ships reaching a total of 5640, as compared with 3266 in 1909–10, and inward messages from ships 34,161, as compared with 27,727, the total increase being 8808, or 28·4 per cent. During the year 97 licences, covering 107 land stations, were granted under the Wireless Telegraphy Act, and, with one exception, these were for experimental purposes. Connected with this subject, we notice the announcement in *The Morning Post* that the wireless telegraph station at Spitsbergen is now completed and ready for use. The machinery is working satisfactorily, and messages are received at Spitsbergen from Poldhu, in Cornwall, and communication is being established with the station at Ingö, in the north of Norway.

Coal is said to have been discovered on the estate of Sir Harry Verney, Bart., at Calvert, in Buckinghamshire, within fifty miles of London. It appears that exploratory work has been carried on intermittently for several years at this locality, and that a boring, which was sunk six years ago in quest of water, encountered coal-gas under pressure of about 60 lb. per square inch at a depth of 470 feet. Two bore-holes are now being sunk, and it is announced that one of them, after passing through an outburst of gas, reached coal at a depth of only 530 feet from the surface. Should this announcement be confirmed, it will justify the belief of those who hold that concealed coalfields may exist at workable depths between the Midland fields and those of Bristol and Somerset. So far back as 1877 a famous boring at Burford, in Oxfordshire, struck Coal-measures at a depth of 1184 feet, beneath a cover of Jurassic and Triassic rocks. At Batsford, in Gloucestershire, Coal-measures have likewise been found beneath Secondary strata.

At the monthly meeting of the Pharmaceutical Society, held on October 4, the president, Mr. C. B. Allen, handed the Hanbury gold medal and a cheque for 50*l*. to M. Eugène Léger, of Paris. The Hanbury gold medal is competed for every two years, and the winner receives also

50*l*. from a fund left by the late Sir T. Hanbury, brother of the late Mr. Daniel Hanbury, of whom the medal is a memorial. The council of the Pharmaceutical Society are the trustees of the fund, and the adjudicators the respective presidents of the Linnean, Chemical, and Pharmaceutical Societies and of the British Pharmaceutical Conference, together with Mr. Walter Hills. M. Léger is a member of the committee of revision of the French Pharmacopœia, and his work in connection with the chemistry of the active constituents of drugs is well known. A short time ago M. Léger was elected an honorary member of the Pharmaceutical Society.

THE trustees of Lake Forest University, Illinois, send particulars of the second decennial prize of 6000 dollars on the Bross Foundation. The prize was founded in 1879 by William Bross, of Chicago, as a permanent memorial of his son, Nathaniel Bross, who had died in 1856. Its object is to stimulate the production of the best books or treatises "on the connection, relation, and mutual bearing of any practical science, or the history of our race, or the facts in any department of knowledge, with and upon the Christian religion." The scope of the gift is so comprehensive that any phase of science, of literature, of human history, or of modern life that may throw light upon the Christian religion, or upon any phase of the same as it is received by the great body of Christian believers, would be a fitting theme for a book offered in the competition. The prize will be given to the author of the best book on any of the lines above indicated which may be presented on or before January 1, 1915. The manuscripts, accompanied by a sealed envelope containing the name of the writer, must be sent on or before the above date addressed to the President of Lake Forest College, Lake Forest, Illinois. It is requested that no manuscript be sent in before October 1, 1914. A copy of the circular containing all the essential conditions made by the deed of gift, or any further information desired as to this competition, may be obtained on application to President John S. Nollen, Lake Forest, Illinois.

A LECTURE on "Emotions and Morals" was delivered on October 4 by Dr. William Brown at the inauguration of the new session at King's College, London. In the course of his address, Dr. Brown said that modern theories of ethics are finding it more and more necessary to take account of the psychological nature of man in formulating their moral ideal. This is particularly the case with respect to the emotional side of consciousness, since it is in the emotions that all values reside. After rapidly reviewing the more important modern theories held as to the nature of the emotions, and their classification under the two main headings of simple and complex, and showing by a detailed analysis that love and hate are not emotions, but systems of emotional dispositions dominated by a fixed idea, he proceeded to sketch out the modern theory of *values* in its most general form, and to show (after Ribot) that the feelings have a logic of their own, distinct from, and not necessarily inferior to, that of pure reason, and that the logical primacy of pure reason over feeling, though generally held by the classical philosophers, is not by any means complete. In a digression on the psychology of music he discussed the intellectual "arabesque" theory of Hanslick and the more generally accepted emotional theory to which Schopenhauer and all the great creative musicians have subscribed, and stated his own view that music expresses a system of emotions *sui generis*, but in dynamic relation with the ordinary emotions, and is therefore of ethical importance. The imperative of duty may be expressed in the form, "Seek always the highest good," which would seem to be personality for ourselves and others.

The Times of October 4 announces the death, in September, at Bandra, a suburb of Bombay, of Lieut.-Colonel A. S. G. Jayakar, late of the Indian Medical Service, who when stationed at Muscat—latterly as surgeon-general—collected and presented to the British Museum during the last two decades of the nineteenth century a number of specimens of mammals, birds, reptiles, and fishes indigenous to the Oman district of south-eastern Arabia and the adjacent sea. When describing the mammals in 1894 (Proc. Zool. Soc.), Mr. Thomas remarked that Colonel Jayakar's collection was the first ever received from that district; it included a new and small species of thar (*Hemitragus jayakeri*), a genus of wild goats previously known only from India, and a new hare, while it also showed that the range of the Syrian hyrax extended to Oman. The birds included a new eagle-owl, described by Dr. Sharpe in *The Ibis* for 1886, and a new bee-eater, figured by Mr. Dresser in his monograph of that group. A fine skeleton of the short-beaked sword-fish (*Histiophorus brevirostris*), exhibited in the fish gallery at the British Museum (Natural History), was the gift of Colonel Jayakar, although there is no intimation of that fact on the descriptive label. Colonel Jayakar was born in Bombay in 1845, where he received the first part of his education; in 1867 he came to London, where, after taking the degrees of M.R.C.S. and L.R.C.P., he entered the Indian Medical Service, to which but few natives had been admitted up to that date. The greater part of his service was passed as residency surgeon at Muscat, where he remained for thirty years.

WE regret to announce the death of Dr. Joseph Bell, one of Edinburgh's distinguished surgeons. He was born in Edinburgh in 1837, educated at the Academy and University, and graduated M.D. in 1859, becoming soon afterwards resident house-surgeon under Prof. Syme. He thus followed the family tradition, for his father, grandfather, and great-grandfather had been surgeons. Dr. Bell became a Fellow of the Royal College of Surgeons of Edinburgh in 1863; in the same year he commenced to teach systematic surgery, and in the following year operative surgery. These courses were continued, with growing success, until 1878, when Dr. Bell was appointed senior acting surgeon in the Royal Infirmary. On his retirement he was made consulting surgeon, an appointment which he held to the last. Dr. Bell was one of the originators of the Royal Edinburgh Hospital for Incurables, and was surgeon to this, to the Eye Hospital, and the Royal Hospital for Sick Children, and consulting surgeon to many medical institutions in the city. He was the author of a manual of the operations of surgery, of useful notes on surgery for nurses, and of papers, describing some of his most interesting cases, published in *The Edinburgh Medical Journal*, of which he was editor for twenty-three years. For many years Dr. Bell was examiner in surgery in the Royal College of Surgeons, Edinburgh; for some time he was honorary treasurer, and later, for a period of six years, president, an office which his father had held twenty years previously. Dr. Bell was a man of strong and sympathetic personality, and was highly esteemed in the community in which he worked so zealously. He possessed to a remarkable degree the power of keen perception and of quick deductive reasoning; his surprising deductions from apparently trivial details suggested to Sir A. Conan Doyle, who was a student under Dr. Bell, the character of Sherlock Holmes.

Mr. R. Campbell Thompson, in *The Times* of October 9, has issued a further report on the excavations at Carchemish, which were started in the early part of the present year by Mr. D. G. Hogarth. The mound presents a record of continuous human occupation, beginning with that of a primitive race using flint knives, obsidian flakes, and hand-made pottery. These people were succeeded by the Hittites, who were enabled by the use of bronze weapons to overcome the primitive occupants of the site. Finally, in B.C. 717, the Assyrians captured the place, and bricks have been found inscribed with the title of "Palace of Sargon, King of Nations, King of Assyria." A remarkable result of these excavations is the discovery of numerous small pottery horses, which served some religious purpose or were used in some game. The Hittite sculptures already unearthed add considerably to our knowledge of the beliefs of that people, consisting of guardian door figures, winged lions, and protecting demons, like those of Assyria. A remarkable bas relief depicts the overthrow of an Assyrian, and proves that the latter race practised circumcision.

Prof. Boyd Dawkins, in *The Times* of October 6, remarks that the discovery of an ancient canoe on the edge of the Baddiley Mere, used for the water supply of Nantwich, reminds us that the recent drought offers an exceptional opportunity for the examination of the desiccated margins of all sheets of water in Great Britain. A similar protracted failure of rain in 1853–4 led to the discovery of numerous pile dwellings in Switzerland. Similar erections are found in considerable numbers in Ireland and in Scotland; but, so far, the discoveries of this kind in England and Wales are singularly poor. In the Lake District only one settlement of the Neolithic age, that on Ehenside Tarn, has been discovered. Wales has yielded one of doubtful age in the lake of Llangorse, Breconshire. There is one in the Vale of Pickering and the Marshes of Holderness, and in Norfolk one in Barton Mere and two near Thetford, all three of the Bronze age. If we add to these the three lake settlements at Glastonbury and Mere, the total amounts only to eight. Prof. Boyd Dawkins believes that careful search during this exceptional season, before the lake margins are covered by the autumn rains, would reveal prehistoric settlements in almost every county, and throw as much light on the daily life of the early inhabitants as the discoveries made elsewhere have done. It is not yet too late to seize the present unusually favourable opportunity for making these investigations.

The August issue of *The National Geographic Magazine* is largely and appropriately devoted to Morocco and Tunis. It includes an interesting article by Mr. G. E. Holt, American Vice-Consul General, describing two religious dances performed at Tangier. These displays are provided by two separate sects which have widespread influence, not only over Morocco, but in Algeria, Tunis, and even so far eastward as Egypt. One of these is the Aisawa, followers of the saint M' Hammed Bin Aisa; the second the Hamadsha, founded by Sidi Ali Bel Hamdush, a later and less influential body than the former. Each motion in these dances is a symbol of some phase of the Mohammedan religion or of one of the sectarian beliefs. One position, for instance, represents Islam on the defensive against Christianity; another the final triumph of the faith of the Prophet. Women share in these performances; and in one movement a male and female dancer bend down and tear the earth with their teeth, symbolising the Creation, when Adam and Eve lived on the fruits of the soil, an ideal of the simple life recommended to their descendants. These dances, well illustrated by photographs, describe an interesting phase of that active sectarian fanaticism which, in the near future, is likely to be a serious embarrassment to those European Powers which are at present engaged in adventures in North Africa.

We have received the September number (vol. i., No. 12) of *The Child*, a monthly journal devoted to child welfare, which completes the first year's issue. This number, which is well printed and illustrated, contains, among others, an excellent article by Dr. Mary Scharlieb on adolescent girls from the viewpoint of the physician. Valuable advice is given on diet, exercise, dress, and moral training for the adolescent girl.

Messrs. E. Leitz, Oxford House, London, W., have issued a circular respecting dark-ground illumination and ultra-microscopic vision. They direct attention to the fact that these methods of microscopical investigation, while often rendering visible objects which by ordinary illumination cannot be seen, do not enhance resolving power. The methods depend on the principle that brightly illuminated objects can be better seen on a black background than on one which is itself bright.

The *Bulletin de la Société d'Encouragement pour l'Industrie Nationale* for July (T. 115, No. 7) contains a report by M. F. Grenet on porous porcelain filters, particularly the form known as the Pasteur-Chamberland. By osmotic pressure determinations, it is calculated that the pores vary in size from $1\cdot08\,\mu$ to $2\cdot16\,\mu$ ($\mu=0\cdot001$ mm.) as minima and maxima. Collodion tubes also form extremely fine-pored filters, capable of retaining ultra-microscopic particles. By using a porous porcelain filter tube as a support for the collodion tube, the "life" of the latter may be much prolonged; M. Grenet has had one in use for a year, and it is still perfect.

The variation of micro-organisms, particularly bacteria, is at the present time attracting considerable attention. Mr. Cecil Revis describes the artificial production of a permanent variety of *Bacillus coli* (*Centr. f. Bakt.*, 2te Abt., Bd. xxxi., 1911). It was obtained by growing a strain of *B. coli* in broth containing 0·05 per cent. of malachite-green. After fifteen subcultivations, at intervals of about three days, its power to produce gas (formerly active) in lactose, dulcitol, mannitol, and glucose was completely lost, but the capacity to produce acid was retained. With salicin, at first acid was formed, but after the treatment this substance was no longer attacked. Acid-formation and curdling in milk remained practically unaltered, as well as the characters of the growth on gelatin. The new physiological condition of the organism is quite permanent, and all attempts to reproduce the power of gas-formation have been unavailing.

A form of paralysis, particularly attacking certain muscles of the lower limbs in children, and known as infantile paralysis, has been the subject of much research by Flexner, Levaditi, Landsteiner, and others during the last two or three years. The disease is sudden in onset, and sometimes occurs in epidemics, and is due to an inflammatory condition of the large motor cells in the anterior horns of the grey matter of the spinal cord. In the *Revue générale des Sciences* for September 15 Dr. Levaditi gives a good summary of our present knowledge of the causation, &c., of the disease. It is infective, *i.e.* is due to a micro-parasite, which is so minute that it passes through the pores of a porcelain filter, and is hence beyond the limit of visibility with the microscope. The disease can be transmitted to apes, injection of material from a human case reproducing the disease in these animals.

IN No. 1860 (vol. xli., p. 297) of the Proceedings of the U.S. National Museum Mr. C. W. Gilmore describes, under the new generic and specific name of *Brachychampsa montana*, a crocodilian skull from the Cretaceous of Montana. The specimen indicates an alligator-like reptile, distinguished from all other members of the alligator-group by the absence of a posterior expansion of the hinder part of the premaxillæ to roof over the front of the nares. There are fourteen pairs of upper teeth, five of which are borne by the premaxillæ.

A NEW species (*B. tener*) of the stegocephalian genus Branchiosaurus, from the Rothliegendes of north-western Saxony, is described by Mr. G. Schönfeld in the *Abhandlungen Ges. Isis* for 1911, p. 19. It is characterised by the gills persisting at least to a late period of life, by the slenderness of the bones of the middle of the roof of the skull, the presence of teeth on the vomers and palatines, and in the young state on the pterygoids, and by the small scales being marked with a radiating sculpture and concentric growth-lines.

THE "Bibliotheca Geographica" for 1907 has been published by the Gesellschaft für Erdkunde of Berlin, having been edited, as in the preceding years, by O. Baschin. In size this most useful volume of reference remains about the same; a few changes in the classification have been made as experience has shown to be desirable, and this sixteenth volume fully maintains the high reputation of its forerunners as a most convenient and comprehensive guide to geographical literature.

IN the *Mitteilungen der k.k. Geographischen Gesellschaft* of Vienna (Heft 8) a detailed account is given of the construction of a map from the photographs taken by Dr. Pietschmann during a recent expedition in Mesopotamia. An ordinary camera and stand, slightly modified to enable him to take rounds of views suitable for cartographical purposes, enabled him, it is claimed, to obtain material sufficient for producing a far more complete and accurate map than he could otherwise have done, and that without too great interference with his other occupations.

IN the August and September numbers of *The Geographical Journal* Mr. J. C. Brauner discusses at some length the geological structure of Bahia and the form and position of the principal mountain ranges of this part of Brazil, in which he spent eight months in 1907 when studying the geology. The paper contains a great deal of interesting geological material, but, as a geographical description, lacks that coordinating treatment which is needed to give a full and explanatory account of an area.

PROF. OTTO NORDENSKJÖLD, in the September number of *The Geographical Journal*, discusses some questions of general importance relating to the nature of the Antarctic regions. The general orography of the north-western portion, which faces the South American continent, is sketched out, and the Antarctic climate and the character of its glaciation is considered, especially with reference to the influence of land-ice. The great masses of it which collect lower the summer temperature and tend to make that of winter somewhat milder, so that the land is gradually wrapped in ice, and vegetable and animal life is extremely sparse. Full discussion of such matters will appear in the course of the year in the geographical part of the results of the Swedish South Polar Expedition.

THE Meteorological Chart of the North Atlantic Ocean for October, published by the Deutsche Seewarte, shows that at the beginning of September icebergs were seen in the Belle Isle Strait, and were still met with to the eastward on the ocean routes. A useful series of synoptic charts illustrates the very stormy weather which occurred between the Azores and the European coast from April 18–22, 1909, inclusive. It rarely happens that storms of hurricane force travel eastwards from the Azores in April. The monthly charts show that at this period depressions originating to the west of those islands usually take a northerly course. The disturbance in question travelled in an E.N.E. direction until April 21 at the rate of 400–500 miles a day, then struck northwards, joined an area of low pressure coming from N.W., and arrived off the south of Ireland early on April 22. The sudden and unexpected appearance of this storm is referred to in the report of the Meteorological Committee for the year ended March 31, 1910.

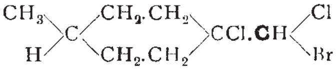
WE have received the first four numbers of the Journal of the Washington Academy of Sciences, to be published semi-monthly except in July, August, and September, when monthly. The academy publishes a series of Memoirs, of which the first volume is dated 1866, the second 1884, the third 1885, and the remaining volumes at somewhat irregular intervals; these memoirs contain long papers. In 1899 a series of Proceedings was commenced containing papers shorter than those in the Memoirs, issued to members at intervals; at the end of each year these are collected into volumes, with indexes and title-pages. The present serial will replace the Proceedings, and is intended for shorter papers written or communicated by resident or non-resident members of the academy, for abstracts of scientific literature published in or emanating from Washington, for proceedings and programmes of the affiliated societies, and for notes of events connected with the scientific life of Washington. Parts i. and ii. (published together) contain 48 pages, and part iii. 56 pages. Many of the papers are of considerable interest, and extend over a wide range of subjects. The abstracts appear to be well done; the references give the name of the publication, the volume and pages of the beginning and end of the paper, and they are all from papers of the present year, indicating the desire to print the abstracts so soon as possible after the appearance of the originals. The Journal of the academy will be more useful both to residents and non-residents than the Proceedings of which it takes the place.

THE July number of *Science Progress*, which was not received until last month, while particularly strong on the biological side, is sufficiently catholic in its articles to ensure that its readers have a wide and accurate knowledge outside their own special grooves. Dr. Waller, one of the advisory committee of the journal, proves that to Magendie rather than to Bell must be ascribed the discovery of the functions of motor and sensory nerves. Dr. Russell shows how the work of the Bureau of Soils of the United States Department of Agriculture has suffered materially owing to their neglect of the biological, as distinct from the chemical, processes going on in the soil. Prof. Bragg gives an outline of the facts of radio-activity, and shows that they force us to give up the idea of the impenetrability of matter.

PUBLICATION No. 149 of the Carnegie Institution of Washington consists partly of a reprint of a paper from *The Philosophical Magazine*, partly of new matter, and deals with a detailed investigation by Prof. C. Barus and his son of the conditions under which light produced by diffraction at a plane grating can be made to give interference fringes. The grating is mounted at one end and the eye-piece at the other end of a rod, the ends of which slide along tracks at right angles to each other, as in the

Rowland mounting for a concave grating. If a beam of parallel light from a collimator falls on a transmission grating, and is observed through a telescope after reflection, the spectrum is crossed by bands, which are due to the interference of rays diffracted at the grating surface and reflected from the back surface; rays transmitted through the grating surface without diffraction, then reflected and diffracted on their return; and, lastly, rays diffracted at the grating surface only. The authors develop the method, and produce an interferometer which is easily set up and possesses two degrees of sensitiveness, the higher corresponding to about half a wave-length of light.

AN interesting sequel to their observations on optically active substances containing no asymmetric carbon atom (NATURE, 1910, vol. lxxxvi., p. 93) is described by Profs. Perkin and Pope in the August number of the Journal of the Chemical Society. For this type of asymmetry they propose the name "centroasymmetric," and their last communication deals with the conversion of "centroasymmetric" compounds into derivatives containing asymmetric carbon atoms, and *vice versa*. It is shown that, although two isomeric derivatives are sometimes produced, the optical activity of the compounds persists in all cases in which the molecule remains asymmetric. The models used by Prof. Pope in describing his observations to the Chemical Section of the British Association at Portsmouth are reproduced as photographs, the careful orientation of which makes them even easier to understand than the original solid figures. A point of considerable interest is the description of a compound



which owes its optical activity to an asymmetric atom linked to the three univalent radicles H, Cl, Br, the asymmetric carbon atoms of all active compounds described hitherto having been linked to at least two other carbon atoms.

A NUMBER of new uses of explosives in agriculture are described by Mr. F. H. Gunsolus in the Journal of the Franklin Institute for August. In the North-Western Pacific States dynamite is largely used for clearing land of tree-stumps; but a more novel application is to drill holes from 2 to 5 feet into the soil and to explode dynamite cartridges in them, in order to break up and loosen the subsoil. This process may be carried out on land where orchards have already been planted, the quantity of dynamite used varying from 25 to 100 lb. per acre. Explosives are also being used very largely in the Western States for digging ditches, especially in swampy clay ground. Slanting holes are punched at intervals of about 2 feet along the line of the proposed ditch; the middle hole is loaded with two or three cartridges, the explosion of which serves to detonate the charges in the other holes, with the result that a mile or more of ditch may be blasted simultaneously. The earth from the ditch is scattered evenly over the adjoining land, and the presence of stumps, trees, and underbrush interferes scarcely at all with the success of the operation.

A COPY of the October issue of the catalogue of second-hand instruments for sale or hire, by Mr. C. Baker, of High Holborn, London, has been received. The list contains particulars of more than 1500 pieces of apparatus, including a large selection of microscopes and astronomical telescopes. Customers unable to call at the showrooms to inspect pieces of apparatus can, on certain conditions, have them on approval for three days.

THE latest catalogue of general chemical apparatus and laboratory accessories issued by Messrs. A. Gallenkamp and Co., Ltd., of Sun Street, Finsbury Square, London, E.C., is likely to become a much consulted work of reference in chemical laboratories. The profusely illustrated volume runs to 800 pages, and provides full particulars, conveniently arranged, of all apparatus required for general use in the laboratories of every grade of educational institution, and those of industrial works where apparatus for research is employed.

OUR ASTRONOMICAL COLUMN.

BELJAWSKY'S COMET, 1911*g*.—From positions determined on September 29 and October 1 and 3, Dr. Kobold has calculated the following elements for the orbit of comet 1911*g*, which has now become an object for evening observations:—

$$T = 1911,\ \text{October } 10\cdot196.$$

$$\left.\begin{array}{l}\omega = 71^\circ\ 39'\\ \text{☊} = 88^\circ\ 44'\\ i = 96^\circ\ 38'\end{array}\right\}1911\cdot0$$

$$\log q = 9\cdot4823$$

From the ephemeris derived from these elements we give the following:—

Ephemeris 12h. Berlin Midnight.

1911	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	mag.
Oct. 12	13 37·6	+8 59·1	9·4931	0·0051	2·4
,, 14	14 1·0	+6 30·3	9·5190	0·0201	2·6
,, 16	14 21·2	+3 43·9	9·5545	0·0375	2·9
,, 18	14 38·5	+0 54·3			
,, 20	14 53·2	−1 52·6	9·6355	0·0752	3·4

The calculated magnitude at perihelion was about 2·3, but, owing to the rapid increase in distance, from both the sun and the earth, it is decreasing rapidly, and with the decreasing northerly declination the object is becoming a difficult one to observe; as the tail is approximately vertical, however, it may be possible to observe it, low down in the west, after the head has set, as was done in the case of comet 1910*a*.

Observations show that the tail, unlike that of Brooks's comet (1911*c*), is of the broad parabolic type often associated with great comets and small perihelion distances.

According to a *Times* communication, Mr. Hinks observed the comet between 16h. 30m. and 16h. 45m. on October 5, and estimated the magnitude of the nucleus as 3·5; only about 2° of the tail was visible. He also saw a strong zodiacal light just before dawn.

A tail 15° long was seen by Prof. Nijland, at Utrecht, on October 1.

QUÉNISSET'S COMET, 1911*f*.—The following is a further extract from Dr. Ebell's ephemeris for comet 1911*f*, which is still observable throughout the earlier part of the night:—

Ephemeris 12h. M.T. Berlin.

1911	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	mag.
Oct. 12	15 33·1	+38 19·3	9·9903	0·0252	6·7
,, 14	15 35·2	+35 11·9			
,, 16	15 37·0	+32 14·4	9·9707	0·0499	6·7
,, 18	15 38·5	+29 26·4			
,, 20	15 39·8	+26 47·5	9·9519	0·0754	6·8

All these positions lie near to a line joining μ and δ Coronæ, the comet's apparent path lying almost due south.

BROOKS'S COMET, 1911*c*.—Brooks's comet passed the sun on October 12, and became a morning comet; as shown in the following abstract from Dr. Kobold's ephemeris, its apparent path now lies through Coma:—

Ephemeris 12h. M.T. Berlin.

1911	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	mag.
Oct. 11	13 10·8	+30 2·5	9·7970	9·7899	4·3
,, 13	13 2·6	+27 10·7			
,, 15	12 55·4	+24 14·5	9·7583	9·8178	2·8
,, 17	12 49·1	+21 16·1			
,, 19	12 43·9	+18 15·5	9·7241	9·8498	2·8
,, 21	12 39·7	+15 13·1			